ASD TECHNICAL REPORT 61-417

A COMPARISON OF ISOLATION EFFECTS AND THEIR PERSONALITY CORRELATES IN TWO DIVERGENT SAMPLES

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RESEARCH CENTER FOR MENTAL HEALTH
NEW YORK UNIVERSITY
NEW YORK, NEW YORK

AUGUST 1961

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BIOMEDICAL LABORATORY
AEROSPACE MEDICAL LABORATORY
AERONAUTICAL SYSTEMS DIVISION
AIR FORCE SYSTEMS COMMAND
UNITED STATES AIR FORCE
WRIGHT-PATTERSON AIR FORCE BASE, OHIO

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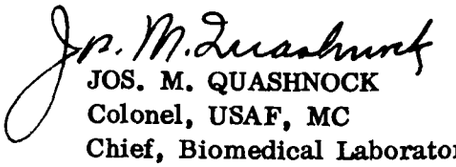
FOREWORD

This is the final report of work carried out under Contract No. AF33(616)-6103, Project No. 7222, "Biophysics of Flight," and Task No. 71745, "Psychophysiology of Flight," monitored by Victor H. Thaler, Captain, Biophysics Branch, Biomedical Laboratory, Aerospace Medical Laboratory. The work was conducted at the Research Center for Mental Health, New York University (21 Washington Place, New York 3, New York) between October 1959 and February 1961, and involved the assistance of the entire staff. We are particularly grateful to Bernice Hamerling, who served as the graduate assistant throughout the project, and to Dr. Gokce Cansever for her assistance in rating the isolation protocols. Our thanks are extended also to Miss Anna Campittello for her conscientious work in preparing this manuscript.

ABSTRACT

Findings are reported from a pair of replicated studies using male subjects and conditions of perceptual isolation (sensory deprivation) similar to those used in the McGill studies. The first group consisted of fourteen undergraduates; the second group consisted of sixteen unemployed actors. All subjects were put through an intensive multiform assessment, which included a battery of objectively scorable tests, plus qualitative data from projective techniques, interview, and autobiography. Reactions to the altered sensory environment, which the subjects experienced for eight hours, were judged from the typed protocols of their verbalizations during the period of confinement. In all, fourteen dependent variables were derived from the protocols. These were then intercorrelated, and both the individual variables and their syndromes were related to the variables from the personality assessment. First the general group phenomena, then the patterns of correlations are discussed, with the special emphasis on those that were replicated. Implications for space flight are discussed in terms of the nature of the sensory alteration involved and other specific aspects of the experiment.

PUBLICATION REVIEW



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INTRODUCTION

When one reviews the growing literature on isolation and sensory alteration (14, 20, 21), two facts are especially striking. First, there are certain abnormal mental phenomena, changes in cognitive and affective states, which have attracted a great deal of attention. But just as remarkable is the second fact: that individual differences in reaction to any such altered environment have been very marked. Some men break down easily when removed from the support of their usual surroundings and companions; others withstand remarkable hardships, deprivations, or both. Clearly, any program that involves exposing people to highly unusual environments and situational stresses, such as a program for the exploration of space, must take careful account of these differences and must seek to learn the qualities of a man that fit him for such unusual missions.

Even the briefest space flights will involve separating men from the support of perceiving their usual environments, especially the loss of bodily sensations of gravity, and prolonged flights in which there will be little for the astronauts to do will expose them to the stresses of monotony and confinement as well as the lack of familiar earthly sights, sounds and other sensations. For these reasons, there may be something to learn about selection for space flight from a study of reactions to experimental confinement, isolation and perceptual monotony, and attempts to find aspects of personality that predict such reactions. Any such study will have to settle on operational definitions for three critical sets of terms: (1) Terms describing the exact situation of sensory alterations used. (Perhaps different types of persons will do well under different types of experimental conditions.) (2) Variables measuring the subjects' reactions to the situation, or measures of its effects. Such measures may vary from objective tests of intellectual or motor performance to subjective evaluations of spontaneous productions. (3) Variables of personality that can be measured and correlated with individual differences in experimental effects.

For the purpose of general orientation it should be noted at the outset that many of the measures we found useful stem from the theoretical basis of our interest in these experiments. Our investigations have been conceptualized in terms of the psychoanalytic theory of thinking, in which a leading role is played by the concepts of primary and secondary process. The primary process is a hypothetical extreme of disordered, dream-like, hallucinatory, unrealistic and fantastic thought-operations, most closely approximated in acute schizophrenia. The secondary process, by contrast, refers to an ideal of logical, orderly, realistic, and adaptive thinking-processes.

In the psychoanalytic theory, it is assumed that the drives are almost always active, and ready to take over thinking and force it towards the primary process extreme if contact with ordinary, well-structured reality is removed. At the same time, according to Rapaport's theory of ego autonomy (19), a person who is in touch with

his drives and has a well-compensated, highly differentiated set of ego structures is able to maintain secondary process thinking despite a severance of contact with reality, and is also able to allow primary process into his conscious waking thought without being disturbed or overwhelmed by it. In any event, we relied on this theoretical framework in selecting variables in terms of which to study the effects of isolation.

In this report we will present the findings obtained with a group of 16 unemployed actors who served as subjects in an eight hour isolation experiment. This study was undertaken to see whether or not we could replicate the findings of an earlier very similar study (6, 9) in which college freshmen were used as subjects and to learn the extent to which the earlier findings could be generalized.

Method

Subjects and procedures. The choice of actors as subjects for this study was primarily dictated by practical considerations, such as the difficulty encountered in getting enough Air Force pilots (our original choice of subjects) from nearby bases, and the time limitation characterizing most other potential population groups. Since only about 10% of the members of Actors Equity, the actors' union through which we advertised for subjects on a paid hourly basis, are employed in the theater during any one year, we found little difficulty in obtaining a basic subject pool, numbering a total of 50 actors who passed certain set screening procedures and who agreed to participate in a program of rather time-consuming studies being conducted concurrently at the Research Center for Mental Health.

All potential subjects were first given the Minnesota Multiphasic Personality Inventory (MMPI). We then eliminated from further consideration any subject with an obviously psychotic profile, and also made use of a number of "stop items" (e.g., "My soul sometimes leaves my body"), positive answers to which looked as if they should be disqualifying. Those who survived this screening were asked to come in for a clinical interview, which was carried out by one of half a dozen members of the staff (including the authors). The purpose of the interview was to eliminate near-psychotic persons, psychopathic character disorders, persons with strong paranoid trends, and those who were insufficiently motivated or who might exclude themselves once they found out the nature of the experiments. They were told that there would be four parts to the experimental program: first, they would be asked to take a drug (LSD-25), which was harmless and non-addictive, but which had a variety of interesting intellectual and emotional effects. Second, they would serve as subjects in a dream experiment, requiring three nights in a dream laboratory. Third, they would take part in a simulated space flight of 3 days and 3 nights (since at the time the experiment was begun it was anticipated that all subjects would go through a 72-hour isolation experience). Finally, they were told that an extensive personality assessment would be conducted, involving interviews, an autobiography, and a number of psychological tests. Subjects were paid for their time at the rate of $1.50 an hour, and were offered complete confidentiality and an opportunity to

discuss th ir results with a staff member at the completion of the series of experiments. Subjects who survived this phase of the screening were then given a Rorschach test and an intelligence test, the Wechsler-Bellevue (W-B). If the Rorschach indicated not too pathological a configuration, they were then accepted for the experimental program.

Because of the high incidence of homosexuality in this population, we did not consider that a sufficient basis on which to exclude a subject if in other respects his adjustment seemed reasonably sound. As a consequence, among the 16 subjects used in the second study there were at least 5 who had a predominantly homosexual orientation. The actors' ages ranged from 21 to 42; 12 of the 16 were under 30. They were a somewhat older group than our undergraduate freshmen, whose ages ranged from 17 to 29.

Since we wanted to replicate the first study, so far as possible, with a different population of subjects, conditions were kept as much as possible the same as before. There were, however, a few deviations in procedure: A small chemical toilet was placed in the room so that the subject could take care of his own bodily needs; and a small ice chest was also provided with his food contained inside. These two pieces of apparatus made it possible for the subject to spend the entire eight hours without any contact with the experimenter. Because he had to take care of himself, the cardboard gauntlets and cotton gloves used in the earlier study were not employed. Unlike the earlier study, too, there was no observation mirror in the particular room used, so the experimenter (who was always present) had to judge what the subject was doing only by sounds that were transmitted over an intercom system. In other respects, the procedure was virtually identical. The room was again only semi-soundproof, thus the subjects were fitted out with the same flexible leather helmet containing padded earphones as was used before, through which a constant masking "white" noise was introduced (by means of a Random Noise Generator, range: 20kc, maintained at an output voltage of 1). The subjects wore pingpong-ball cutouts over their eyes, held in place by rubber cement. The subject lay on his back on a comfortable bed, having been told only that the experiment was one of doing nothing for a day and was instructed to move as little as possible. They were asked to report their "thoughts and feelings from time to time," and were told that if they found the situation too unpleasant they could of course be released.

At the end of the eight hours, the experimenter asked the subject to summarize briefly his reactions during the day. Then, after first giving a 90-minute battery of cognitive tests (described in 10) over the intercom, the experimenter went into the isolation room, helped the subject remove the eye-cups and helmet and began to interview him closely on his experience. (See Appendix A for a copy of the questionnaire around which the interview was structured. The subject was also given an "LSD questionnaire" to compare his isolation responses with that of the drug; see 10.) The subjects' spontaneous verbalizations while in the chamber, the summary statement at the termination of eight hours, and the final interview were recorded on tape; code numbers instead of the subjects' names were entered on the transcripts.

Analysis of data. The data were analyzed in essentially the same manner as in our first study. That is, after the protocols were transcribed from the tapes they were read and rated by two independent judges,* each of whom rank ordered the subjects according to the following variables: imagery; controlled primary-process thinking; poorly controlled primary-process thinking; unimpaired (or free) secondary-process thinking; impaired secondary-process thinking;** stimulus-bound thinking; pleasant affect; immobility; self-stimulation and exploration; quitting; sleep; and verbal output. In the first study, the reliabilities of rating ranged from .80 to .99; in the second study, from .25 to .88. Except for two variables (controlled primary process: .25; and immobility: .27) the reliability of judgments was satisfactory in the second study, the next lower rho being .68 (regressed secondary process). The poorer agreement between judges in the second study is partly a function of reduced range of variation in the actor sample, and the fact that, as was pointed out, there was no one-way vision mirror, so that immobility had to be inferred rather indirectly in the second study.

These variables were intercorrelated, and, as it turned out, in both samples they fell into two syndromes. New rank orders were then made up for the two syndromes, and they were correlated with rank orders on a variety of tests of personality, cognitive style, and intellectual functioning.

Personality assessment. All subjects in both samples were given a sizable battery of tests as part of a personality assessment. A list of the tests administered to the actors, in addition to the MMPI, Rorschach and Wechsler-Bellevue that were given as part of the screening procedure, follow:

1. Grygier's Dynamic Personality Inventory (DPI) (7).
2. Morris' Paths of Life (16).
3. Allport, Vernon and Lindzey's Study of Values (A-V-L) (1).
4. Jenkins' How Well Do You Know Yourself? (Jenkins) (12).
5. Barron & Welsh's Art Scale (2).
6. Guilford's creativity tests: Brick Uses and Consequences (8).
7. I. H. Paul's test of memory style (17).
8. Knapp's Tartan Esthetic Preference Test (Tartan) (13).
9. Pettigrew's Concept Width Test (CW) (18).
10. Szondi Test.

Correlates will be presented only for the first 7 tests, which were the same for both samples.

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*Actually, this variable underwent a change. In the first study, it consisted largely of complaints of inability to think consecutively and productively; in the second, there were few such complaints, and instead the raters fell back on rating the presence of regressed secondary process in the form of disjointed, free-associative sorts of remarks.

**The senior author and Dr. G. Cansever. The ratings of the former were used in subsequent analyses.

To supplement and round out the personality assessment data, we requested each subject to write an autobiography which, together with the Rorschach, the Thematic Apperception Test, W-B, and the transcript of the clinical interview, formed the basis for ratings (using 9-point scales) on 150 items grouped under three headings: Thoughts and Inner States, Motives and Defenses, and Identity and Interpersonal Behavior. The items were selected, and in some instances slightly modified, from the pool of 180 items used in the first study.

The ratings were again assigned by members of our staff. Unlike the procedure followed in the first study, this time the ratings were not forced into a normal distribution as prescribed by the Q-sort technique, and in most cases a single rater was used instead of pairs, as before.

Results

I. General group findings. We shall first present some of the general kinds of phenomena encountered in the actor group, relating them, where possible, to comparable data from the college student group.

To begin with, it can safely be stated that the actors found the experience less stressful than did the college freshmen. Three subjects in the first sample terminated before the eight hours were up, none of the actors quit, or even came very close to quitting. One obvious reason for the lessened stress of isolation upon a group of actors may lie in their frequent prolonged unemployment, which makes the experience of doing nothing one that is likely to be somewhat ego-syntonic. Be this as it may, our actors did not find the experience very pleasurable either, although there were quite a few expressions of how good it was to "just relax for a day" particularly in the early part of the experiment. Without exception, however, they characterized their experience as being dominated by boredom and semi-conscious drifting with occasional feelings of restlessness, lethargy, and, in a few instances, depression. A feeling that was shared by all subjects in both studies was a concern over time—how much time had passed, what time it was, feelings of distorted time-sense, and "if only I had a watch everything would be all right."

A conspicuous way in which the situation was handled, and one that further confused the subjects' time sense, was by sleeping. The actors slept as much as the college students, if not somewhat more, as can be seen in Table 1. The number of separate periods of sleep ranged from 1 to 7, the average being about 3.

Nine subjects (as compared to 7 in the first study) reported the occurrence of dreams. Of these subjects 3 had dreams containing elements related to stress: bailing out from an airplane; a dripping water faucet; and a contest in which a cat had to climb a greased pole. Two subjects had wishfulfillment dreams: seeing self smoking a cigarette, and riding a bicycle through the park on a bright day. The subject who apparently wished he was riding a bicycle instead of being cooped up, also had a nightmare in which he was in a room without a doorknob. When he awoke he quickly checked the door to see whether it had a knob (it did!). Four of the subjects

didn't remember their dreams except in a very general way. For instance, one remembered only that it involved a play he had been associated with.

Table 1

Amount of Sleep (computed per hour)	Number of Subjects	
	College Students (N:14)	Actors (N:16)
0 minutes	3	0
1-15 "	4	5
16-30 "	4	7
31-45 "	3	4

When they were not actually sleeping the majority of subjects reported that they were in a drowsy, semi-conscious state in which they just drifted along rudderless. Ten subjects reported this passive state of mind as being one of their primary modes of passing time. Examples from the protocols follow: "I just let my mind go blank...lie here vegetating...seems to make time go faster..." (S4), "I anticipated doing all kinds of compulsive mental exercises to pass the time but didn't very much... I'm just letting my mind wander..." (S5), "I was in a sort of animated suspension thinking about nothing a great deal of the time...just let my mind sort of run at an idle, and just kick over, mull over the things that have happened to me...things just floated in and out..." (S7), "It seems to me the best way of preventing...boredom is not to bear down upon anything, but to let the mind find its own subject and to fix on it with its own volition..." (S14). One subject made specific mention of not wanting to think about anything, while another stated that: "I didn't try to stimulate my thoughts to the point where I would get completely awake" (S1). As a group the actors, in contrast to the college students, seemed to have had less difficulty in "letting the mind find its own subject"—their thoughts varying in form from reminiscences, daydreams, and fantasies (frequently experienced in vivid imagery) to reality-attuned problem-solving and planning, which, however, tended to be quite fleeting and unfocussed in the drowsy state.

The content of the daydreams and fantasies ranged far and wide. There were the usual actors' success-dreams—a Broadway part, dinner at Sardi's, a terrace-penthouse apartment; quite a few sexual daydreams in which past escapades were reviewed and a wish for feminine companionship was voiced; there were some rarer kind of fantasies involving space travel, snakes, the inside of the stomach, and, in one instance, the blood in the capillaries of a rabbit's eye, the fate of Amelia Earhart and Ambrose Bierce ("...he is probably lying in a chamber with ping-pong balls over his eyes and a headset on..."). There were nightmarish fantasies having to do with falling off the Empire State Building, setting off a blast by lighting a cigarette, medieval torture chambers, sad gladiators caught in a pit, the killing of a fatted calf,

morgues, monsters, daggers, and airplane crashes. Because of the obvious drive-implication of this material it furnished much of the raw data for our assessment of primary-process thinking, although formal elements of the primary process also occurred, as for instance the following striking clang association:

> "I am trying to remember the names of all the states, there is one I always forget, I have to remember to say get not git—get, set, let, bet, het—I had a teacher named Mrs. Hett, once, she looked like a Helen Hokinson cartoon, nice woman though..." (S15)

This would seem to be a good juncture at which to examine our findings pertaining to the occurrence of spontaneous images since most of them were experienced in a drowsy, hypnagogic state and frequently involved some primary process element. Although all subjects answered in the affirmative when asked about the occurrence of imagery in the post-isolation interview, there was a good deal of variation in the prominence of imagery reports as judged by the spontaneous part of the experimental protocols. Eight subjects, about the same number as in the first study, stand out as having had a good deal of imagery. The following is a random selection of the kinds of images these subjects spontaneously reported together with the time of their occurrence.*

10:20 I have an image of a parade—I'm pretty sure that it comes from the sound [i.e., white noise] which seems, as I say, far off and brass-band like without any melody which is sort of the vague impression that one has of a brass band being several miles away. (S14)

10:30 Just saw an image of being outside a building, and there's about one story above me in dark brick, it was night and a window in which there was, you know, the wooden sections...(describes in great detail.) (S14)

10:37 Another mental picture of a coin, fifty-cent piece, falling and spinning noiselessly on a black and white tile floor, large tile, about six-by-six tile, and it amazed me because there was no sound to it, the spin of the coin, it was in a corner—quite clear image, I could see the wall was stucco (describes in detail)... That's very odd because it is a rather detailed, irrelevant image to come to mind, I can't tie it to anything that has ever occurred, I can't remember ever having seen a fifty-cent piece falling on a surface like that—may be something I glimpsed just before you put the eye-cups on. (S14)

11:53 Gee, I just had a strange flash—the rear of an automobile, speeding down or across a salt flats or something—but only the

*Subjects entered isolation at about 9-9:30 a.m.

rear, that's very strange, two wheels—a brown and tan car, like a Plymouth or something. I wonder what the front looks like. (S15)

3:25 ...Funny, I can visualize a nice green, now. Ohhh, lovely green, sort of chartreuse, no, oh green and brown patterns, like cobble-stone street, with tan bricks and green bricks (continues with description). (S15)

4:26 Funny, I see a stone wall, great heavy stones, rough, unfinished...Ah, beautiful, beautiful full-bodied women in etching, in woodcut, no, an etching—very fine lines—you know. (S15)

11:05 Hmmm, I just had a, shall I say, a momentary visual image of something like a line drawing of a, I don't know, a post, like a mailbox post or a fence post with a telephone on, or something like that...it was that of a line drawing—came out of nowhere. I can't even clearly identify what it was, something on a post or a stand. It's so vague it could even have been a fireplug. That's a funny feeling... (S5)

1:33 Hmmm, I just happened to close my eyes and turn my head to one side and I had a most interesting, what you might call, well not an after-image, but images, most distinct images—I remember seeing, it was like Kodachrome, color photograph, every detail sharp—I suppose it's, uh, it's the absence of seeing anything but the gray—my eyes are open, I close them and I was surprised, there was the image of several familiar objects, such as my Martin guitar and so forth—but I saw them in very sharp detail, like one of these very realistic oil paintings or Kodachrome color slides for a moment—I didn't identify all the objects, but it looked like my Martin guitar or a coke or something lying on the edge of a desk—but it is interesting, whenever you close your eyes you see the darkness, colors, sort of vague shapes swimming around, very generalized—but this is actually a sharp image. (S5)

10:01 Things go very rapidly across my mind, one then another, no real things. Images just seem to go very rapidly across my mind, nothing stays very long so that I can get a definite picture. There's one, and there's another, and another right behind that so that there's no real picture coming into my mind...too quickly...at one point there was a series of flashes of light, a small one, and then a larger one, and another point in there, was the old army, the old posters of Uncle Sam Wants You type thing. (S3)

The images reported above are mostly in the visual modality, but quite a few of the subjects experienced spontaneous phenomena in other modalities as well. As in our first group, about half the subjects reported auditory images in response to the constant hiss from the white noise generator; e.g., the imagined hearing of a waterfall, ocean-surf, a dentist's drill, etc. In two subjects, the auditory experience was of a borderline hallucinatory character, e.g.:

> 1:10 Hmmm, I would almost swear I heard someone holler one syllable in my little earphones just now, unless there was some outside noise or something, just one little beep. (S5)

Two more subjects (S14, S12) had hallucinatory experiences in the olfactory realm; one experienced a strong and persistent odor of cold cream while the other reported the following:

> 4:35 I just had a strong olfactory reaction to something, but I don't smell it any more and I don't even know what it was. I don't know whether it was involuntary or an hallucination—but, uh, it just lasted for a moment, I was thinking about something else. (S14)

One subject reported the following borderline delusional and hallucinatory phenomena within an hour after the experiment commenced:

> One of my first impressions was that the sound was entering my head through something besides my ear, or ears. It seemed as if the sound was coming through the top of my head. I also had the vague sensation that the bed was moving at one time, very slightly, but later I thought it was my breathing, which I do think it is now. (S13)

Again there were some instances of relatively mild and fleeting distortions of the body image and feelings of depersonalization. Five subjects felt their bodies as being heavier than usual. One subject thought that "...the feeling of not being able to see makes you give some extra weight to the body. Not actually extra weight, but a sense of extra weight." (S6) Another S (S16) reported a loss of sensation in parts of his body and a feeling of merging with the background. Yet another subject, when queried about body image distortions, said: "At one time it almost seemed the only thing on my face was eyes and ears—nose and mouth were nowhere." (S10) One of the two instances of depersonalization was very reminiscent of the "two-ness" phenomenon reported by Bexton, Heron and Scott (5):

> 11:55 I seem to have a feeling that somebody else, I mean it's not a feeling of a face, it's sort of story-like in shape (sic)—that there is another person who is involved in this, experiment-type, uh, subject, who keeps appearing in these little

> stories I imagine, not the same one, but it seems like I feel that this thing should have two people, plus the experimenter. (S3)

As in our first group, the majority of subjects at one point or another engaged in some form of self-stimulation, as if intermittently to become reactivated. In seven subjects this was particularly noticeable. They would characteristically sing, whistle, hum, tap, in rhythm with feet or fingers. One subject spent a good deal of time reciting in a dramatic way some of the parts that he had played, another did his vocal exercises, while a couple more said they "cheated" by having moved their fingers over the surface of the translucent eye-cups to create different designs with the shadows. A couple of the subjects came prepared with things to think about or mental games to play. S16, for instance, came prepared with plans to think about music and a recent museum visit, and to do some mental arithmetic if necessary, but found that he "didn't have to fall back on them." To explore the surrounding walls, the icebox, and the chemical toilet was another form of stimulation obtained by many of the subjects, as was the activity of eating (mentioned specifically by two subjects). Two other subjects deliberately postponed eating for hours in order to have "something pleasant to look forward to." The category of thought that we have rated as "stimulus-bound" furnished further self-activation. As in the first study there were thoughts concerned with the layout of the room, space travel, POW and other isolation situations that the subject had heard or read about, thoughts about the experimenter: what he is doing, how he can tell whether the subject is asleep or not, how to improve the experiment for him, concern over possible abandonment, etc.

The actors as a group seemed to show a much stronger interpersonal tone in their isolation utterances; it was almost as if they needed, and were playing to, an audience. They certainly had a larger share of exhibitionists in their midst than did the college group, although this fact is not reflected in the quantitative measure of verbal output (number of lines in the isolation protocol) on which the groups appear to have been about even (see Table 2). Retrospectively, it would seem that if we had discouraged talking, it would have added a significant component of stress for this sample. In this connection it might be incidentally noted that for at least three subjects the inability to engage in another oral activity, namely, that of smoking, was viewed as the most unpleasant aspect of the experience, according to their own statements. Also, in connection with verbal output, it might be noted that, like in the first sample, there were a few subjects who found it an effort to talk or complained that talking interfered with their thinking.

Table 2

Amount of Verbal Output During Eight Hours of Isolation

Number of type-written lines in protocol	Number of Subjects College Students (N:14)	Actors (N:16)
0	3*	0
1-49	4	7
50-149	3	5
150-250	2	1

450-700	1	3

1200-1300	1	

*Note that two of these subjects terminated within about three hours.

To sum up: the reactions to eight hours of isolation were by and large the same, in the sense that essentially similar phenomena were produced, for the actors as for the college students. The former, however, seemed to have been less threatened by the enforced passivity, which the isolation situation entailed, and by the state of unfocussed, hypnagogic or drive-directed drifting that seemed to be so characteristically evoked by the situation.

II. Individual differences and their personality correlates. We shall now turn to the findings that pertain to individual variations in isolation reaction and how these are related to enduring, stable aspects of personality structure, as measured by objective tests and clinical assessment.

As mentioned earlier (page 4), the response variables were intercorrelated and a syndrome analysis following Horn's technique (11) was performed. In both samples, there emerged a similar pattern of intercorrelated reactions to isolation, which we have called the adaptive syndromes (see Tables 3 and 4 for the total intercorrelation matrices). In both samples, this includes unimpaired secondary-process thinking, controlled and accepted primary process, imagery, self-stimulation and

Table 3

Rank-order Correlations (Rho) between Measures of Isolation Effect, Study 1

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Pleasant affect													
2. Controlled primary process[a]	.84**												
3. Free secondary process	.67**	.67*											
4. Self-stimulation	.45	.71**	.37										
5. Imagery[a]	.68*	.88**	.77**	.60*									
6. Immobility	.36	.60*	.32	-.15	.68*								
7. Verbal output	.72**	.70**	.95**	.29	.87**	.41							
8. Sleep	.18	.22	-.05	.28	.05	.00	-.13						
9. Unpleasant affect	-.67**	-.43	-.52	-.53*	-.56	-.16	-.56*	-.28					
10. Poorly controlled primary process	-.09	.33	.13	-.02	.30	.02	.19	-.10	.37				
11. Impaired secondary process[b]	-.58*	-.16	-.44	-.44	-.22	-.10	-.42	-.01	.53	.75**			
12. General disturbance[a]	-.46	-.14	-.29	-.40	-.19	-.01	-.34	-.22	.52	.58*	.64*		
13. Quitting	-.61*	-.26	-.17	-.18	-.05	-.26	-.15	-.40	.58*	.37	.25	.37	
14. Stimulus-bound thought	.33	-.01	.40	-.09	.34	.25	.54*	-.22	-.42	.17	.01	.21	-.13

* .05 level; ** .01 level (two-tailed test) a N=12, b N=13, for the remaining variables N=14

Table 4

Rank-order Correlations (Rho) between Measures of Isolation Effect, Study 2 (N=16)

	1	2	3	4	5	6	7	8	9	10	11
1. Controlled primary process											
2. Free secondary process	.91**										
3. Self-stimulation	.71**	.61*									
4. Imagery	.64**	.47	.58*								
5. Regressed secondary process	.61*	.76**	.52*	.40							
6. Sleep	-.73**	-.67**	-.68**	-.66**	-.66**						
7. Unpleasant affect	-.02	-.14	.32	.19	-.23	-.24					
8. Quitting	-.11	-.24	.14	.06	-.45	-.02	.81**				
9. Pleasant affect	.42	.54*	.02	.40	.64**	.30	-.65**	-.76**			
10. Immobility	-.19	-.04	-.60*	-.41	.11	.15	-.36	-.52*	.40		
11. Verbal output	.00	.00	-.23	-.28	-.11	.27	.22	.20	.08	.35	
12. Stimulus-bound thought	.12	.12	-.09	.32	.07	-.22	-.36	.10	.02	.27	.21

* .05 level; ** .01 level (two-tailed test)

exploration. In the first sample, pleasant affect and verbal output also formed part of this syndrome; in the actor sample, regressed secondary process is part of the syndrome, plus sleep, which correlates negatively with all the other variables in it. In the first sample, the median intercorrelation was .67; in the second sample, .66.

The second cluster of intercorrelating variables, most of which were unrelated to the components of the first syndrome, we have called the maladaptive reaction to isolation. In both studies, this includes unpleasant affect and quitting (that is, preoccupation with terminating the experiment). With the first sample, the maladaptive syndrome included also poorly controlled primary-process thinking,* complaints of impaired secondary process thinking, and general disturbance on a questionnaire.** In the second sample, it included two variables both of which correlated negatively with unpleasant affect and quitting: pleasant affect, and immobility. (Note that these were both part of the adaptive syndrome in the first sample; both had a few correlations with components of the adaptive syndrome in the second sample, but fit best into the maladaptive one.) In the first sample, the median intercorrelation was between .52 and .53; in the second sample, it was between .58 and .59.

In both samples, the two syndromes did not show any significant degree of correlation, much as they may appear at first glance to be logical opposites of each other. In the first sample, the maladaptive and adaptive syndromes correlated -.33; in the second sample, the corresponding correlation was -.07. Thus, the maladaptive reaction is not just a lack of adaptive manifestations; it is characterized by active complaining (statements of discomfort, threats of walking out, and the like). The maladaptive syndrome, in both samples, yielded fewer personality correlates, which, considering the somewhat lower median intercorrelations, suggests that it is less homogeneous a measure.

In presenting the personality correlates of the two syndromes, we will both compare the present findings with those of our previous sample, and deal with the sample of actors in its own terms, presenting not only the correlates of the syndromes, but also the correlates of the individual components that entered into the syndromes. In the tables to follow, correlation coefficients (Spearman rank, Rho) are included up to the 10% level of statistical confidence, except for Table 5 where a few non-significant coefficients are included for purposes of comparison and exposition.

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*In the second sample, there was not enough variance on poorly controlled primary process even to rank-order this variable.

**The questionnaire that gave rise to the variable of "general disturbance" was not used in the second study.

Correlates of the adaptive reaction. Table 5 presents the personological correlates of the adaptive reaction that were either substantially similar or different in the two studies. The correlations have been arranged in a conceptually related manner so as not to obscure redundancies and overlap in the measures that were used.

As can be seen at a glance, looking at Table 5, there are both consistent similarities and equally consistent changes in the patterns of correlations. We note that in both samples the adaptive reaction to the isolation situation is associated with personality features denoting artistic, aesthetic, creative, intellectual interests, needs or identity. Coupled with these features are others having to do with originality, flexibility, and efficiency in recalling past events without importing irrelevancies. The findings certainly seem reasonable considering the greater capacity for self-activation or internal nutriment that a person possessing these attributes has at his disposal in dealing with the isolation situation.

That the adaptive reactor is one who is not overly inhibited, rigid and controlled, and one who does not habitually complain and whine about diffuse bodily symptoms, is again not an unreasonable set of findings. Certainly the concept of ego-strength makes excellent sense in this context, and to find that the operational measure of it (i.e., Barron's ego-strength scale from the MMPI) is correlated with the adaptive reaction in our two divergent samples is a theoretically welcome finding.

But what about the differences between Study 1 and 2? We believe that the key to the discrepant findings is to be found in the differing role of masculinity-femininity vis-a-vis ego strength in the two samples of men. It is quite clear from Table 5 that the adaptive reactor in the college freshmen group scored high on feminine identification (and associated orally passive features), while the adaptive reactor among the actors scored high on masculinity (and associated features of muscular activity, political value and a negative view of dependence and nurturance-giving situations). Considering the high positive correlation of Barron ego strength scale with the adaptive reaction (particularly strong in the actor sample), we believe that in our group of actors for whom passivity was generally quite congenial, and among whom homosexuality was such a problem, those who are more masculine tend to have the stronger egos.* Among the students of education, the ones with high scores on masculine identification presented a picture of hypermasculinity in which manliness was identified with violent muscular activity. For such young

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*Checking this point statistically, by correlating measures of sexual identity with our measure of ego strength, satisfactory confirmation was obtained (Jenkins' Transexual Identification and Barron ego strength scale, Rho = -.58, $p < .02$; MMPI M-F scale and Barron ego strength scale, Rho = -.45, $p < .10$). The relationship between masculinity and ego-strength was found to be insignificant in the parallel set of correlations for the student sample.

Table 5

Comparison of Selected Correlates of Adaptive Reaction to Isolation

	Study 1		Study 2	
	Rho	N	Rho	N
Aesthetic, creative, artistic personality				
Allport, Vernon, Lindzey (A-V-L): Aesthetic value	.66*	12	.38	16
Rating: Intellectual, aesthetic, creative needs	.63*	12	.48[a]	16
" Artistic, sensitive and creative identity	.63*	12	.42[a]	16
" Economic value	-.42	12	-.61**	16
Barron-Welsh Art Scale (preference for complexity, asymmetry)	.75**	11	-.09	16
Intellectual flexibility and effectiveness				
Brick uses: Flexibility	.65*	11	.30	16
Paul's (IHP) Memory Style: Importation	-.67*	12	-.46[a]	16
Rating: Stereotyped, unoriginal and narrow concepts and interests	-.83**	12	-.64**	16
Femininity vs. Masculinity				
MMPI: Masculinity-Femininity (M-F)	-.06	12	-.66**	16
Dynamic Personality Inventory (DPI): Feminine identification scale	.55[a]	11	-.22	16
Rating: Feminine vs. Masculine in style and manner	.82**	12	-.63**	16
" Feminine identification	.59*	12	-.52*	16
Jenkins: Transexual identification	.69[a]	8	-.76**	16
DPI: Masculine identification scale	-.11	11	.74**	16
Rating or Ranking of Path 12: (Active somatotonic mastery)	-.62*	11	.62**	16
A-V-L: Political value	-.49[a]	12	.56*	16
Service for others and dependence				
Ranking of Path 3: (Nurturant love of others)	.64*	10	-.76**	16
DPI: Early oral (or oral dependence)	.62*	11	-.18	16
Emotional freedom, ego strength				
MMPI: Barron Ego Strength Scale	.61[a]	9	.71**	16
" Hypochondriasis	-.55[a]	12	-.52*	16
Rating of Path 10: (Stern Spartan self control)	-.79**	11	-.29	16
Rating: Inhibited, uncommunicative, rigid self concept	-.51[a]	12	-.55*	16

[a] $p \leq .10$; * $p \leq .05$; ** $p \leq .01$ (two-tailed test)

men, to lie quietly and passively was too great a threat; in this group, the presence of feminine interests was highly correlated with a set of values and interests that connoted a rich inner life and congeniality for a situation of lying around and thinking. Among the actors, on the other hand, those who were at the masculine extreme of the distribution were in many respects not far from the subjects who reacted adaptively in the first sample; in them, a reasonably balanced mixture of masculine and feminine interests did not preclude the existence of ego-syntonic passivity and an adequate inner life, but was a sign of generally more effective personality organization. At the low end of masculinity in the group of actors were a couple of compulsively promiscuous homosexuals with rather disorganized ego structures (as will become evident when we look at the correlates of the most passive of reactions, sleep, which correlated negatively with the adaptive reaction).*

Table 6, which presents all the personological correlates of the adaptive reaction for the actors, further highlights what was anticipated in the above discussion. We note that the pattern of masculinity is particularly strong, indicating the salience of sexual identification for this sample with its unusual concentration of homosexuals. Related to this masculine emphasis are the correlates grouped under the headings Active, energetic, outgoing, Ego-strength, flexibility, self-assertion, and Rejection of compliant dependence. These obviously "healthy" personality attributes are joined by still other "healthy" features (grouped under essentially the same headings as were found relevant for adaptive reactors in study 1): Absence of conspicuous neurotic features and Intellectual flexibility, breadth and richness.**

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*When we compared the actual score values for the two samples on the variables in Table 5, we found (as anticipated in the above discussion) the means for the variables subsumed under Aesthetic, creative, artistic personality and Masculinity vs. Femininity to be consistently higher for the actors—reaching statistical significance on quite a few comparisons. On the MMPI-derived M-F scale, for example, the mean for the student sample was 58.53 (S.D. 11.50), which is in the normal range of the standardization population, while for the actors the mean was 76.53 (S.D. 11.95), i.e., close to the extreme femininity pole of the M-F dimension. This difference was found to be significant at the .001 level of statistical confidence. Obviously, then, when we refer to patterns of masculinity in the correlational data (of the actors in particular), we are making a gross relative statement, since our most "masculine" actor was in fact not only quite feminine, as compared to the population at large, but he was about as masculine as our most "feminine" subject in the student sample. For contrast, it should be added here that on none of the other comparisons in connection with Table 5 did the two samples show difference-trends. Thus on the Barron ego strength scale, for example, the means and standard deviations almost coincided.

**In connection with the positive I.Q. finding it should be pointed out that in the first sample, in which intelligence did not correlate with reaction to isolation, we were dealing with a restricted range of I.Q. since we preselected the students so that all scored at the 40th percentile (or better) on the college norms for the Ohio State Psychological Examination (a group test of intelligence). For the actors less restriction was made on intelligence, so that one of them had a W-B I.Q. as low as 105; the upper extreme was an I.Q. of 143.

Table 6

Correlates of Syndrome I: Adaptive Reaction to Isolation, Study 2

[Composite of Controlled Primary-Process thinking, Unimpaired and Regressed Secondary-Process thinking, Self-stimulation and exploration, Imagery, and Sleep (negatively correlated with all the foregoing)]

	Rho
Masculinity	
Jenkins: Feelings of sexual inferiority	-.70**
" Homotropism	-.49*
" Transexual identification	-.73**
MMPI: Masculinity-Femininity	-.66**
Dynamic Personality Inventory (DPI): Pure phallic type of interest	.56*
" " " " Masculine identification	.74**
Rating: Confused sexual identification (feminine identification)	-.52*
" Is masculine in style and manner of behavior	.63**
" Tends to identify with authority figures	.42
" n Dominance	.55*
" Strong need for opposite sex; seeks sexual satisfaction through love; oriented towards heterosexual relationships	.77**
" Homosexuality (manifest or latent)	-.72**
Active, energetic, outgoingness	
Jenkins: Motor tempo	.54*
Rating of Path 11: (Give up the world and develop the inner self)	-.48
" " " 12: (Active somatotonic mastery; outward energetic action)	.62**
Allport, Vernon, Lindzey (A-V-L): Political value	.56*
DPI: Drive, energy	.46
" Interest in exploration, adventure	.48
Rating: Strives for his goals persistently and with endurance	.47
" Is active and resourceful in seeking work of the kind he wants	.57*
Ego strength, flexibility, self-assertion	
Jenkins: Vocational self-sufficiency	.42
MMPI: Barron Ego Strength Scale	.71**
Rating of Path 7: (Flexibility and many-sidedness, gives a place for contemplation and enjoyment as well as for action)	.57*

Note: Unless otherwise noted N in this and the succeeding tables is 16.

* .05 level; ** .01 level (two-tailed test)

Table 6 (continued)

	Rho
Ego strength, flexibility, self-assertion (cont.)	
Ranking of Path 7: above	.56*
Rating: Afraid to assert self	-.42
Rejection of compliant dependence	
Rating of Path 13: (Submissive dependence)	-.50*
DPI: Submissive to authority	-.61*
" Initiative, self-reliance, organizing interest	.52*
Rating: Suggestible and dependent on others to take initiative	-.70**
" Rebels against paternal figures	.44
" Submits to maternal figures; complies	-.55*
" n Succorance - needs protection, support	-.56*
" Fears possible future privation; anticipates being exploited, cheated	.57*
Absence of conspicuous neurotic features	
Jenkins: Ruminative autism	-.46
" General inferiority	-.47
" Extroversial distractibility	-.46
" Phobias and specific fears	-.56*
" Misanthropy	-.49*
MMPI: Hypochondriasis	-.52*
" Block Psychoneurotic Scale	-.48
DPI: Insularity, prejudice, hostility	-.44
Rating: Inhibition and overcontrol	-.55*
" Turning against the self: Feels depressed as a defense against aggression	-.48
" Aggression pent up; great deal of unexpressed anger	-.49*
Intellectual flexibility, breadth and richness	
Wechsler-Bellevue (W-B): Full scale I.Q.	.48
" " " Verbal I.Q.	.49*
A-V-L: Theoretical value	.56*
DPI: Anal, conservative, rigid	-.61*
" Anal sadism, discipline	-.51
Paul's (IHP) Memory Style: Importation	-.46
Rating: Has dependable and practical common sense and good judgment	.65**
" Analyzes problems skillfully, actively and accurately	.43

Table 6 (continued)

	Rho
Intellectual flexibility, breadth and richness (cont.)	
Rating: Has the identity of the intellectual	.48
" n Order	-.46
" n Understanding - seeks explanation, wants to understand the reasons for things	.43
" Thinking is blocked and inhibited	-.58*
" Thinking is stereotyped, unoriginal and concrete (vs. imaginative)	-.64**
" Has narrow range of interest	-.65**
" Thinking shows much evidence of naivete	-.82**
" Values information for its own sake	.57*
"Bohemian" and other characterological features	
Jenkins: Impolitic frankness	.55*
" Personal recklessness	.53*
Ranking of Path 3: (Nurturant love of others; sympathy, concern for others, restraint of self)	-.76**
A-V-L: Economic value	-.61*
" Social value	-.50*
DPI: Unconventional outlook	.58*
" Creative interests	.48
Rating: Identity of sensitive, creative artist	.42
" Uses words in a pompous, ostentatious way	.44
" Lacks insight into own motives and behavior	.65**
Pleasure-seeking, sensuousness	
Rating of Path 4: (Abandonment; sensuous enjoyment of life; delight in people and things, solitude and sociality both necessary)	.55*
DPI: Acceptance of sexuality	.48
" Tactile impressions	.44
Rating: n Sentience - seeks and enjoys sensuous experiences	.50*

More difficult to place on a simple mental health continuum are the next two interrelated clusters of correlates having to do with personality features frequently attributed to artists. Our inclination has been to subsume them both under the admittedly difficult-to-define heading of "Bohemian" features. In any event, we view these personality features as being specific to (and as making good intuitive sense for) this particular sample, constituted as it is of young, as yet not too successful, actors whose values, however deeply ingrained, reflect the community of struggling artists. In particular, it may be that the sizable correlation on Path of Life 3, denoting a pattern of anti-nurturance, reflects the narcissism and personal ambition of our best organized subjects found necessary in the highly competitive world of show business. It would seem that in order to get somewhere in that world the aspiring novice must concentrate on advancing his self-interest, must have an over-abundant conviction in his own talent to meet the almost continuous rejection with a minimum of hurt and discouragement.

Correlates of the maladaptive reaction. Table 7 presents the personological correlates of the maladaptive syndrome for the actors. A separate table comparing the results of the two samples is unnecessary since no overlap on specific test variables occurred except on one (Path of Life 5: Pure other-direction) in which a strong positive correlation in the first sample flip-flops to a significant negative one in the second, a reversal that assumes meaning only in context of the total pattern of correlations in the two samples.

The most significant correlations in the first study suggested that the maladaptive response to isolation, which was largely a complaining one, was characteristic of people who were actively opposed to passive, dependent, sheltering situations which they presumably perceived as infantilizing and threatening to their masculinity. These complainers also were notable for their lack of intellectual flexibility and for their economic interests. In the second sample this pattern disappears although the underlying theme of disturbance not only remains but is brought out in full force. Specifically, the maladaptive reactor in the second sample is perhaps best described as one who has adopted a non-conformist, negativistic, uncooperative approach—not only towards the experiment—but to life in general. It may not be amiss to characterize him as showing the so-called beat syndrome (i.e., rebellion without a cause, rejection of social controls as an end in itself).

To revert back for a moment, the negative correlation on the Path of Life denoting pure other-direction, mentioned above, in this context would seem to reflect a kind of misanthropy, a rejection of control by others as part of the pattern of negativism and suppressed rebellious non-compliance, rather than healthy inner-directedness. Conversely, in the first sample the high positive correlation on other-direction may be interpreted as denoting an over-dependence on the external world, presumably in an effort to ward off threatening inner impulses.

Table 7

Correlates of Syndrome II: Maladaptive Reaction to Isolation

[Unpleasant affect and its negative correlate Pleasant Affect, Quitting, Immobility, and Verbal output]

	Rho
Social deviance; poorly defended, conspicuous pathological features	
Jenkins: Emotional reticence	-.42
" Sympathy	-.43
" Kinesthetic empathy	-.50*
" Cholinergic superfactor (frankness, buoyancy, spontaneity, energetic, prudently attentive to danger or risk)	-.42
Ranking of Path 1: (Refinement, moderation, restraint; participation in social life to understand and preserve best attainments of man)	-.48
Ranking of Path 5: (Extraversion and pure other-direction)	-.59*
Barron-Welsh Art Scale (preference for complexity, asymmetry)	.47
DPI: Acceptance of sexuality	.51*
Rating: Tends to identify self with the outcast and social deviant	.70**
" Tends to anticipate that people will push him around, compel him into unwanted activities	.42
" Is passively aggressive: negativism, forgetting obligations, etc.	.49*
" Is excited by eroticized thoughts of cruelty or destructive power; fantasies of injuring, humiliating others (covert n Aggression, sadism)	.60*
" Unconscious need for punishment; self-defeating, gets self into painful situations (n Intra-aggression)	.51*
" Depersonalization: Under stress experiences estrangement from his environment; loses sense of self	.48
" Regression: Regresses in face of stress, retreats to an earlier mode of functioning	.44
" Repression: Conveniently forgets and excludes unacceptable ideas and impulses from access to action and awareness	-.43
" Alert and sensitive to small differences or slight cues	.51*
" Experiences diffuse anxiety readily	.48
" Often experiences his thoughts and impulses as ego alien	.44
Superficial attempts at social conformity	
Jenkins: Punctuality	.51*
DPI: Hypocrisy; social conformity	.50*

Table 7 (continued)

		Rho	N
Miscellaneous			
Cognitive Test impairment:	Word-naming	.53*	15
" " "	Serial Seven (time)	.67**	15
" " "	Rhyming	.59*	15
LSD peak-effect, questionnaire, scale X ("weakness")		.71*	10

Still looking at Table 7, we find another apparently puzzling discrepancy: the Barron-Welsh Art Scale which correlated positively with the adaptive reaction in the first sample (see Table 5) now goes along positively with the maladaptive syndrome. This discrepancy may be accounted for by the reported multi-determination characterizing aesthetic preference for complex, asymmetrical designs. This preference, as measured by the Barron-Welsh Scale, has not only been found to differentiate the artists from the non-artists, the sensitive and creative from the conservative and conforming, but has also been found to be associated with a subgroup of "some rather deviant personalities whose behavior tended towards the anti-social and psychopathic, though not without creative aspects to the rebellion" (4).

In addition to the rather massive group of correlates in Table 7 denoting personality disturbance of one form or another, we find objective confirmation, as it were, of the maladaptive reaction (which, it may be recalled was based on ratings of the protocol) in the correlations with cognitive test impairment. These correlations say that the maladaptive reaction to isolation was reflected also in the giving of a poorer test performance at the termination of the experiment, at least on three of the nine tests used.

The finding that the maladaptive reactors also showed an LSD effect characterized by complaints of physical weakness would seem to reflect a readiness to respond to stress with perceived physical dysfunction (since complaints of bodily discomfort were a prominent part of Syndrome II).

Correlates of the Separate Isolation Variables

Tables 8-18 contain the personality correlates of the individual components that went into the two syndromes. They contain essentially only minor variants of the broad strokes that have already been drawn in our discussion of the syndromes. However, we shall, following our earlier procedure (9), very briefly go over each component and pick out features of particular interest.*

*In processing the extensive personality data with the 13 individual isolation variables, some of the personality data were omitted for the sake of simplifying the computational job. The omitted measures were notably the clinical ratings which were in process of being reduced from 300 to a more manageable size as this report was being prepared.

Correlates of controlled primary process. The correlates in Table 8 are about the same as for the adaptive syndrome as a whole. Note the addition of two variables: the Fantasy aspiration scale of the DPI and the traditional Rorschach Movement response. They have been grouped as reflecting capacity for fantasy—a capacity that is certainly involved in the ability to engage in primary process thought. A similar correlate was found in the first study: Q-sor. cluster, "vivid imagery and rich fantasy."

This would seem to be a good place to raise the question of why our Rorschach measure of primary-process functioning did not correlate with the variable under consideration, and with other features of the isolation reaction as well (as it did in the first sample)? The most obvious approach to an answer calls for a focus on the nature of the present sample. It would not be an over-statement to say that we are dealing with a highly select group of persons: young, struggling, frequently bohemian actors who have yet to prove themselves on the stage. The very profession they have chosen puts a premium on the capacity for adaptive regression, suggesting that we are dealing with the extreme end (and probably also with a limited range) of the Rorschach primary process continuum. That this in fact is so is supported by the finding that the actors gave on the average about twice as many primary process responses than the students (total % primary process = 80.17, S.D. 31.17 for the actors, and 43.74% with a S.D. of 12.62 for the students—a difference that is significant at the .01 level). The actors differed significantly also in the degree and kinds of controls, a finding that must await further normative data before it can be properly evaluated. In any event, we were obviously dealing with a very extreme group on the variables pertaining to primary-process functioning.

Correlates of unimpaired secondary process. Table 9 presents the correlates of unimpaired secondary process (i.e., extended thought devoted to topics other than the immediate situation). Of interest here is the reappearance of Rorschach M, indicating that the capacity for delay of action that Rapaport postulated as the principal determinant of M comes in handy for ordinary thought as well as for fantasy. We also note the beginnings of a talkativeness cluster, which gets repeated and enlarged in relation to the regressed secondary process and verbal output variables.

Correlates of regressed secondary process. Ironically, we find in Table 10 a replication of two correlations: the DPI Masculinity scale and Path 13 (Submissive dependence) from the first study. However, considering the context in which these occur in the respective samples, it is doubtful that they have the same meaning. In addition, it is important to bring out that the original variable of Complaints of impaired secondary-process thinking (part of the maladaptive syndrome and consisting of complaints like: "My thoughts keep jumping around"; "I can't concentrate") was actually changed to Regressed secondary process in the present study, because the actors did not make many such complaints. Under the present variable of regressed secondary process, we rated mainly the disjunctive, loosely organized kind of thoughts which did not contain any obvious evidences of the primary process, and which was too fleeting or unfocussed to be rated as unimpaired secondary process.

Table 8

Correlates of Controlled Primary-Process Thought

	Rho
Masculinity	
Jenkins: Feelings of sexual inferiority	-.56*
" Transexual identification	-.56*
MMPI: Masculinity-Femininity	-.50*
DPI: Pure phallic type of interest	.62**
" Masculine identification	.78**
Active, energetic, outgoingness	
Jenkins: Motor tempo	.45
Rating of Path 11: (Give up world and develop inner self)	-.42
" " " 12: (Active somatotonic mastery)	.70**
A-V-L: Political value	.65**
DPI: Drive, energy	.65**
" Interest in exploration, adventure	.42
Ego strength, flexibility, self-assertion	
Jenkins: Vocational self-sufficiency	.46
" Barron Ego Strength Scale	.62**
Rating of Path 7: (Flexibility and many-sidedness)	.62**
Ranking of Path 7: (above)	.56*
Rejection of compliant dependence	
Rating of Path 13: (Submissive dependence)	-.53*
DPI: Submissive to authority	-.49*
" Initiative, self-reliance	.49*
Absence of conspicuous neurotic features	
Jenkins: Extraversial distractibility	-.50*
" Spatial disorientation	-.44
" Phobias and specific fears	-.50*
" Misanthropy	-.44
MMPI: Hypochondriasis	-.64**
" Paranoia	-.42
DPI: Insularity, prejudice, hostility	-.60*

Table 8 (continued)

	Rho
Intellectual flexibility, breadth and richness	
Jenkins: Seriousness	.46
W-B: Full Scale I. Q.	.49*
" Verbal I. Q.	.47
A-V-L: Theoretical value	.51*
DPI: Anal, conservative, rigid	-.66**
IHP Memory Style: Importation	-.43
Capacity for delay and fantasy	
Rorschach Movement responses (M)	.44
DPI: High aspiration in fantasy	.42
"Bohemian" and other characterological features	
Jenkins: Impolitic frankness	.56*
" Personal recklessness	.56*
" Rebelliousness	.43
" Promiscuousness	.42
Ranking of Path 3: (Nurturant love of others)	-.67**
A-V-L: Economic value	-.56*
" Social value	-.52*
DPI: Unconventional outlook	.57*
" Impulsiveness, spontaneity	.45
" Creative interests	.52*
Pleasure-seeking, sensuousness	
Rating of Path 4: (Abandonment, sensuous enjoyment)	.53*
DPI: Acceptance of sexuality	.57*
" Tactile impression	.52*

Table 9

Correlates of Unimpaired Secondary Process

	Rho
Masculinity	
Jenkins: Feelings of sexual inferiority	-.55*
" Transexual identification	-.44
DPI: Pure phallic type of interest	.66**
" Masculine identification	.64**

Table 9 (continued)

	Rho
Active, energetic, outgoingness	
Jenkins: Motor tempo	.46
Rating of Path 12: (Active somatotonic mastery)	.50*
A-V-L: Political value	.55*
DPI: Drive, energy	.52*
Ego strength, flexibility, self-assertion	
Barron Ego Strength Scale	.59*
Rejection of compliant dependence	
Ranking of Path 13: (Submissive dependence)	-.53*
DPI: Submissive to authority	-.57*
Absence of conspicuous neurotic features	
MMPI: Hypochondriasis	-.56*
" Paranoia	-.42
DPI: Insularity, prejudice, hostility	-.44
Intellectual flexibility, breadth and richness	
Jenkins: Seriousness	.43
Rating of Path 7: (Flexibility and many-sidedness)	.64**
Ranking of Path 7: (above)	.64**
W-B: Full Scale I.Q.	.54*
" Verbal I.Q.	.49*
A-V-L: Theoretical value	.58*
DPI: Anal, conservative, rigid	-.55*
Capacity for delay	
Rorschach M	.47
"Bohemian" and other characterological features	
Jenkins: Impolitic frankness	.55*
" Personal recklessness	.45
" Rebelliousness	.49*
" Emotional control	-.47
Ranking of Path 3: (Nurturant love of others)	-.63**
A-V-L: Aesthetic value	.51*
" Economic value	-.48
" Social value	-.48

Table 9 (continued)

	Rho
"Bohemian" and other characterological features (cont.)	
DPI: Impulsive, spontaneity	.46
" Unconventional outlook	.67**
Pleasure-seeking, sensuousness	
Rating of Path 4: (Abandonment, sensuous enjoyment)	.49*
DPI: Tactile impressions	.61*
Talkativeness	
DPI: Oral aggressive	.43

Table 10

Correlates of Regressed Secondary-Process Thought

	Rho
Masculinity	
Jenkins: Feelings of sexual inferiority	-.54*
" Domineeringness	.46
" Transexual identification	-.65**
MMPI: Masculinity-Femininity	-.61*
DPI: Pure phallic type of interest	.56*
" Masculine identification	.62**
Active, energetic, outgoingness	
Rating of Path 11: (Give up world and develop inner self)	-.44
" " " 12: (Active somatotonic mastery)	.56*
Ego strength, flexibility, self-assertion	
Jenkins: Vocational self-sufficiency	.43
" Intellectual inferiority	-.52*
MMPI: Barron Ego Strength Scale	.55*
Ranking of Path 7: (Flexibility and many-sidedness)	.51*
Rejection of compliant dependence	
Rating of Path 13: (Submissive dependence)	-.45
Ranking of Path 13: (above)	-.61*

Table 10 (continued)

	Rho
Rejection of compliant dependence (cont.)	
DPI: Submissive to authority	-.65**
" Initiative, self-reliance	.49*
Absence of conspicuous neurotic features	
Jenkins: General inferiority	-.44
MMPI: Hypochondriasis	-.47
" Block Psychoneurotic Scale	-.45
Barron-Welsh Art Scale (preference for complexity, asymmetry)	-.47
Intellectual flexibility, breadth and richness	
Jenkins: Feelings of intellectual adequacy	.45
A-V-L: Theoretical value	.51*
Brick Uses: Flexibility	.43
DPI: Anal, conservative, rigid	-.62**
"Bohemian" and other characterological features	
Jenkins: Impolitic frankness	.55*
Ranking of Path 3: (Nurturant love of others)	-.52*
A-V-L: Economic value	-.50*
" Social value	-.42
DPI: Unconventional outlook	.69**
Pleasure-seeking, sensuousness	
DPI: Tactile impressions	.47
Talkativeness	
DPI: Verbal aggression	.42
Being a good subject	
Jenkins: Service minded	.48

Correlates of self-stimulation and exploration. We note in Table 11 that the combination of ambitious fantasy, exhibitionism, and humor correlated with self-stimulation; these traits can readily be seen as being required in one way or another in the singing, humming, dramatic acting, etc., that was so characteristic of the actors' behavior in isolation. It might be noted too, that 'exploration' could really be dropped from the name of the variable under consideration since very little exploring actually occurred in this group.

Correlates of imagery. Table 12 contains correlates of imagery. Two of the correlates are the same and fall in similar conceptual clusters as in study 1: Paul's memory style of importation and Block's MMPI scale, measuring neurotic under-control; both negative correlates. It is difficult to see their special relevance to the process of having images, so we have again interpreted them only in a general way as being reflections of the intellectual flexibility and emotional freedom clusters.

Imagery also correlates with a group of scales that together denote being a 'good subject': a wish to cooperate, persistence with the task at hand, and an absence of vain egocentricity. May it not be that our "good" subjects sensed our interest in images (since they had participated in several prior experiments at the Center in which imagery was held at a premium by the experimenter), and consciously or unconsciously gave them to please us? In light of the importance ascribed to the role of transference in isolation experiments (15) this would seem to be a real possibility (cf. "socially perceptive" Q-sort correlate of imagery in study 1).

Correlates of sleep. Sleep, it may be recalled, correlated negatively with the adaptive syndrome in the present study (and therefore in a sense constitutes its opposite). In the first study sleep was independent, although sharing correlates with the adaptive reaction; the total of five correlates being grouped under the headings, Acceptance of passivity and Acceptance of the primary process. These findings suggested that sleep was used in the service of relatively healthy egos as a form of occasional relief from the tedium of the experiment. Looking at Table 13 which contains the present findings, it would be quite impossible to make that same interpretation again. Instead we now find sleep being used as a form of defense against further encroachment of anxiety and depression. The findings could hardly be more emphatic or convincing in pointing to this interpretation. On the basis of these data, we would characterize our sleep-prone subjects as constituting the homosexuals, in the sample of actors, with rather disorganized and weak egos, who suffer feelings of inferiority, inadequacy, depression and anxiety, and who are generally submissive, fearful and inhibited. For a subject to sleep his way through the experiment—even though this was not explicitly prohibited by the instructions—certainly demonstrates "unwilling cooperativeness," one of the correlates of sleep. It is interesting to note also that one of our Rorschach measures, defense demand (rated response by response), correlated in a meaningful way here: the greater need for defense or control that a person's Rorschach responses reflected, the more likely was he to sleep in the isolation situation.

Table 11

Correlates of Self-Stimulation and Exploration

	Rho
Masculinity	
Jenkins: Feelings of sexual inferiority	-.67**
" Transexual identification	-.57*
MMPI: Masculinity-Femininity	-.63**
DPI: Pure phallic type of interest	.54*
" Masculine identification	.60*
Active, energetic, outgoingness	
Jenkins: Motor tempo	.59*
Rating of Path 11: (Give up world and develop inner self)	-.50*
A-V-L: Political value	.69**
Ego strength, flexibility, self-assertion	
Jenkins: Feelings of vocational security	.45
MMPI: Barron Ego Strength Scale	.42
Rejection of compliant dependence	
Jenkins: Submissiveness	-.42
DPI: Submissive to authority	-.42
" Initiative, self-reliance	.67**
Absence of conspicuous neurotic features	
Jenkins: Ruminative autism	-.43
" Phobias and specific fears	-.50*
MMPI: Hypochondriasis	-.42
DPI: Insularity, prejudice, hostility	-.53*
Intellectual flexibility, breadth and richness	
Jenkins: Seriousness	.45
" Humor	.42
DPI: Anal conservative, rigid	-.42
Capacity for fantasy	
DPI: High aspiration in fantasy	.64**

Table 11 (continued)

	Rho
"Bohemian" and other characterological features	
Jenkins: Personal recklessness	.44
Ranking of Path 3: (Nurturant love of others)	-.49*
A-V-L: Economic value	-.62*
DPI: Exhibitionism	.55*
Pleasure-seeking, sensuousness	
DPI: Acceptance of sexuality	.61*

Table 12

Correlates of Imagery

	Rho
Masculinity	
Jenkins: Feelings of sexual inferiority	-.51*
" Homotropism	-.66**
" Transexual identification	-.67**
MMPI: Masculinity-Femininity	-.57*
DPI: Masculine identification	.45
" Feminine identification	-.44
Active, energetic, outgoingness	
Rating of Path 12: (Active somatotonic mastery)	.42
Ranking of Path 6: (Constant activity, striving for improved techniques to control nature and society)	.51*
Rorschach Sum Color responses	.54*
DPI: Drive, energy	.55*
" Exploration	.43
Ego strength, flexibility, self-assertion	
Jenkins: Intellectual inferiority	-.43
MMPI: Barron Ego Strength Scale	.44
DPI: Defensive ego strength	.52*

Table 12 (continued)

	Rho
Rejection of passive dependence	
Jenkins: Dependent initiative	-.53*
DPI: Pure oral	-.51*
" Womb fantasies, passivity	-.46
Absence of conspicuous neurotic features	
Jenkins: General anxiety	-.50*
" Lethargy	-.44
" General inferiority	-.42
" Psychosomatism	-.55*
" Impulsiveness	-.47
" Phobias and specific fears	-.69**
" Misanthropy	-.47
MMPI: Paranoia	-.47
" Block Neurotic Under-control Scale	-.46
DPI: Insularity, prejudice, hostility	-.58*
Intellectual flexibility, breadth and richness	
DPI: Anal sadism, discipline	-.62*
" Hoarding, clinging to objects	-.59*
IHP Memory Style: Importation	-.51*
"Bohemian" and other characterological features	
Ranking of Path 5: (Social extraversion, pure other-direction)	-.59*
A-V-L: Economic value	-.55*
Pleasure-seeking, sensuousness	
Rating of Path 4: (Abandonment, sensuous enjoyment)	.56*
DPI: Acceptance of sexuality	.55*
Being a good subject	
Jenkins: Cooperative	.43
" Impressing others	-.46
" Uncooperativeness	-.54*
" Persistence	.56*
DPI: Narcissism	-.45
Miscellaneous	
Jenkins: Kinesthetic empathy	-.48

Table 13

Correlates of Sleep

	Rho
Anxiety, depression	
Jenkins: Depression	.42
" General anxiety	.50*
" Self-commiserative autism	.52*
" Motor tempo	-.56*
" Situational anxiety	.46
" Phobias and specific fears	.59*
" Adrenergic superfactor (anxiety, autism, depression, inferiority)	.58*
Lack of masculinity	
Jenkins: Feelings of sexual inferiority	.80**
" Homotropism	.56*
" Transexual identification	.73**
MMPI: Masculinity-Femininity	.70**
DPI: Pure phallic type of interest	-.48
" Masculine identification	-.62*
" Hypocrisy; social conformity	-.47
Poorly or pathologically defended, weak ego	
Jenkins: General inferiority	.75**
" Feelings of intellectual adequacy	-.50*
" Introversial distractibility	.44
" Extraversial distractibility	.51*
" Ruminative autism	.64**
" Intellectual inferiority	.49*
MMPI: Barron Ego Strength Scale	-.68**
" Block Psychoneurotic Scale	.68**
Rating of Path 11: (Give up world and develop inner self)	.43
W-B: Verbal I. Q.	-.43
DPI: Initiative, self-reliance	-.47
IHP Memory Style: Importation	.44
Rorschach: Mean Defense Demand	.49*
Submissive, fearful, social conformity	
Jenkins: Unwilling cooperativeness	.42
" Submissiveness	.42
" Misanthropy	.59*

Table 13 (continued)

	Rho
Submissive, fearful, social conformity (cont.)	
Ranking of Path 12: (Active somatotonic mastery)	-.47
A-V-L: Economic value	.63**
" Social value	.44
DPI: Submissive to authority	.44
" Interest in exploration, adventure	-.58*
Inhibited aggression	
Jenkins: Impolitic frankness	-.51*
Ranking of Path 3: (Nurturant love of others)	.52*
DPI: Anal, conservative, rigid	.52*
" Exhibitionism	-.47

We will now turn to the components of the so-called maladaptive reaction pattern which, to recapitulate, consisted of unpleasant affect (and its negative correlate, pleasant affect), quitting, verbal output, and immobility.* The patterns of correlates are less clear here, and as was suggested earlier, the maladaptive syndrome does seem to be a less homogeneous affair. In a way this is not surprising, since common sense would dictate that there are more ways of being maladaptive than adaptive (and for a greater variety of reasons) in a situation as circumscribed and limited as that represented by experimental isolation.

Correlates of unpleasant affect and pleasant affect. The assortment of correlates are a little strange for both of these variables (see Tables 14 and 15), but except for the puzzling grandiose autism** correlate of pleasant affect, we

*It may be recalled that immobility was one of the two variables with rather low inter-rater reliability (Rho = .27) attributable in large measure to the absence of a one-way observation screen. Because of the low reliability and the many apparently meaningless correlations obtained with this variable, a table of correlates will not be presented for it.

**The apparent puzzle may disappear if we consider the following: The experimental situation seemed unpleasant or at best boring to most subjects much of the time. Under such circumstances, to get a high score on pleasant affect, a person might have to have considerable capacity for a defensive, denial-like defense of looking resolutely on the bright side. This is understandably related to grandiose trends, since grandiosity is related to suspicious cantankerousness much as mania is related to depression: it is the same material stood on its head, an affective reversal, as it were.

have been able to order them, at least within the broad boundaries of our conceptual headings. Some of these correlations suggest that the focussing on the unpleasant aspects of the situation—consisting frequently of references to painful backaches—may have served an important defensive, substitutive function. The correlates of pleasant affect seem straightforward in meaning; they suggest that the outgoing, cooperative subject made the most comments referring to pleasant parts of the experience, such as the following: "It's quiet, restful, relaxing in here"; "Well, I enjoyed sleeping..."; "I enjoyed the food, it was real tasty"; or, simply "Gee, doing nothing feels great!" We might also note that two of the correlates from study 1 are replicated: for unpleasant affect, Path 12 (Active somatotonic mastery) is repeated, while Jenkins' Cholinergic superfactor, denoting a frank, buoyant, spontaneous personality, is repeated for the pleasant affect variable.

Correlates of quitting. There are no repeats among the correlates of quitting, given in Table 16. But, then, the relationship between the variable of quitting in the two studies are quite tenuous: in the first one, the three subjects who were highest on this variable actually walked out of the situation; in the second, no subject came even very close to walking out. We were, in effect, sampling two different regions of the distribution of concern with or predisposition towards quitting in the two samples. In both studies, however, quitting is correlated with rather negative personality features.

Correlates of verbal output. The first group of correlates in Table 17 needs no explanation. Let it just be said that to find Talkative gregariousness (a Jenkins' scale) and the DPI Oral aggressive scale correlating with our variable of verbal output (as indeed they should!), by inference, speaks well for the validity of these scales. The finding that a set of obsessive-compulsive characteristics goes along with doing a lot of talking is understandable because rumination, not retentive reticence, was the characteristic expression of this syndrome in our sample. Lastly, with respect to the characteristics of submissiveness and obedience in our verbalizer, we have only to recall that talking was specifically requested by the instructions, and therefore to talk was, in effect, a reflection of obedience.

Correlates of stimulus-bound thought. Finally, we turn to stimulus-bound thought, a variable which, like in the first study, again did not discriminate between adaptational styles: it did not correlate significantly with any other isolation variable and therefore was not included in either syndrome. Stimulus-bound thought is, in effect, a neutral phenomenon. It was shown by all subjects at various periods in time and to varying degrees, and consisted of thoughts about the experiment, the experimental room, etc., only to be expected in all subjects. The correlates are presented in Table 18. The category headings tell the story: a little of everything. There is a small representation of the intellectual flexibility cluster; the absence of neurotic features cluster is there but with suggestions of internal discord (note the correlations with true rhathymia (carefree, happy-go-lucky), defensive ego strength and vocational self-sufficiency), and the dependence cluster is there, but here too with a discordant note.

Table 14

Correlates of Unpleasant Affect

	Rho
Some ego weakness but active, outgoing defenses	
Jenkins: Emotional reticence	-.49*
" Vocational self-sufficiency	-.42
" Kinesthetic empathy	-.60*
" Punctuality	.44
Rating of Path 9: (Quiet receptivity to nature yields a rich self)	-.42
Ranking of Path 12: (Active somatotonic mastery)	.49*
DPI: Obsessive attention to details	.50*
" Defensive ego strength	.44

Table 15

Correlates of Pleasant Affect

	Rho
Good subject; outgoingness, conformity	
Jenkins: Emotional reticence	.49*
" Cooperativeness	.65**
" Service minded	.55*
" Seclusiveness	-.43
Barron-Welsh Art Scale (preference for complexity and asymmetry)	-.60*
Rorschach Sum Color responses	.43
Ego strength, flexibility	
Jenkins: Vocational self-sufficiency	.46
" Feelings of intellectual adequacy	.46
" Intellectual inferiority	-.42
" Cholinergic Superfactor (frankness, buoyancy, spontaneity)	.52*
Miscellaneous	
Jenkins: Grandiose autism	.45

Table 16

Correlates of Quitting

	Rho
Social deviance; poorly defended, conspicuous pathological features	
Jenkins: Service-minded	-.46
" Cholinergic Superfactor (frankness, buoyancy, spontaneity)	-.42
Ranking of Path 1: (Refinement, moderation, participation in social life)	-.52*
Rating of Path 8: (Carefree, relaxed, secure enjoyment)	-.43
Ranking of Path 5: (Extraversion, pure other-direction)	-.51*
Barron-Welsh Art Scale (preference for complexity, asymmetry)	.60*
DPI: Fascination by fire, winds, storms and explosions	.48
" Hypocrisy, social conformity	.49*

Table 17

Correlates of Verbal Output

	Rho
Talkativeness, intelligence	
Jenkins: Talkative gregariousness	.45
DPI: Oral aggressive	.50*
W-B: Full scale	.43
" Performance	.64**
Submissive, obedient, dependent	
Jenkins: Cultural non-conformity	-.44
" Cathectic obedience	.45
" Submissiveness	.50*
DPI: Moving away from dependence	-.43
" Submissive to authority	.52*
Obsessive-compulsive features	
Jenkins: Ruminative autism	.48
" Procrastination	.59*
" Motor tempo	-.46
A-V-L: Religious value	.52*
DPI: Anal sadism, discipline	.56**
" Interest in exploration, adventure	-.53*

Table 17 (continued)

	Rho
Obsessive-compulsive features (cont.)	
DPI: Hoarding, clinging to objects	.47
" Anal, conservative, rigid	.57*
Rorschach M: C ratio	.49*
Rorschach Sum C	-.49*

Table 18

Correlates of Stimulus-Bound Thought

	Rho
Intellectual flexibility, breadth and richness	
Jenkins: Anti-intraception	-.47
W-B: Full scale I. Q.	.43
DPI: Creative interests	.44
Absence of conspicuous neurotic features but internal discord	
Jenkins: Mutual secretiveness	-.53*
" General anxiety	-.52*
" Psychosomatism	-.47
" Rebelliousness	-.48
" Antisocial recklessness	-.57*
" Adrenergic Superfactor (anxiety, autism, depression, inferiority)	-.46
" Impressing others	-.45
" Homotropism	-.47
" True rhathymia (carefree, happy-go-lucky)	-.76**
MMPI: Block Psychoneurotic Scale	-.42
Rating of Path 8: (Carefree, relaxed, secure enjoyment)	.57*
Ranking of Path 11: (Give up world and develop inner self)	-.61*
DPI: Defensive ego strength	.71**
Conflict over dependence	
Jenkins: Active avoidance of help	-.49*
" Need for dependence	-.54*
" Vocational self sufficiency	-.57*
Rating of Path 5: Extraversion and pure other-direction	-.45
DPI: Moving away from oral dependence	-.44

Discussion and Conclusion

It may be recalled that this study was undertaken essentially for the purpose of replicating the seemingly promising pattern of personality correlates found in an earlier eight-hour isolation study. Now that we have completed the study it seems only appropriate to ask how in general we would characterize the outcome, or, putting it simply: did we replicate the earlier personality findings? Since two such divergent samples as college education majors and actors were used, a direct answer cannot be given until the prior issue of what kind of replication could reasonably be expected is settled.

If the expectation is one of finding a point-to-point convergence of specific correlates (as one might well anticipate with nearly identical samples), then our results represent a failure of replication, since only a handful of correlates were identical in the two samples. But is this a reasonable expectation here? We think not. Taking it for granted that personality is complex and multi-determined—that there are many ways in which impulses, needs and traits may find expression in behavior, and conversely, that identical behavioral manifestations may have diverse causal origins—it would seem more in accord with the phenomena under investigation to expect convergence, not on discrete bits of manifest behavior, but rather on underlying features of personality, as they may be evidenced in patterns of behavior. Genotypical rather than phenotypical convergence, in other words.

Concretely, this would mean looking at the data (as we have attempted here) in search of correlational patterns reflecting similar underlying features. If this point of view is accepted, then our results suggest a moderately successful replication of the earlier findings. Not only did we in both studies find two relatively independent and meaningful reaction patterns (albeit with different internal components), but we also found what appears to point to some higher order personality determinants for the correlates of these two reaction syndromes. A fair amount of evidence pointed to ego-strength as the higher-order variable that is coordinated with the adaptive reaction, while some form of a general adjustment problem (notably the "beat" syndrome for the actors, and the syndrome associated with hypermasculinity for the students) seemed to be the common denominator for the correlates of the maladaptive reaction (and for the isolation variables negatively correlated with the adaptive syndrome as well).

What do we mean by "ego-strength"? Following Barron (3), whose operational measure of "ego-strength" correlated positively with the adaptive syndrome in both samples, we would define ego-strength as the collective term for such characteristics as: "physiological stability and good health, a strong sense of reality, feelings of personal adequacy and vitality, permissive morality, lack of ethnic prejudice, emotional outgoingness and spontaneity, and intelligence." Although the point-to-point comparison of our two studies (Table 5) showed convergence on some of these characteristics, it is only by looking at the correlates within each sample's own standard of reference that the full picture comes into

focus. It is then that we become impressed with the salience of intellectual flexibility, breadth and richness and emotional freedom (or absence of conspicuous neurotic features) across sample differences.

In a way, our results would appear to back up the findings of the Project Mercury Candidate Evaluation Program (22) in which psychological stability (which might be roughly equated with "ego strength"), as measured by an overall rating based on both tests and clinical interview, was found to be the only significant discriminator between astronauts and non-astronauts. Despite this generalizability of our data, it still follows, however, that none of our specific test findings can be directly applied to the practical problem of selecting space crews, nor to any other such practical application as the Air Force may be interested in. Our method, however, does seem to us to have worked well in both studies and to offer promise for such problems as the selection of space crew personnel. For research of this latter kind, it would be necessary, first, to simulate the particular pattern of sensory alteration to be expected in the criterion situation—including the duties of the subject—as closely as possible, without the introduction of specific conditions (such as prolonged bed rest) that will not be present in the target situation. And second, it will be necessary to experiment in this work-sample situation with samples of men drawn from the population that will actually be screened for the mission in question. Granted these specifications, relevant reactions to the experimental situation might well be correlated with the same battery of personality tests that we used. Ideally, the resulting predictors should be cross-validated on another, similar sample of subjects before the findings are applied to the actual selection of astronauts. The more we can approximate relevant parameters in the situation and in the sample of subjects, the more confidence we will be able to have in the practical utility of the research findings.

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APPENDIX A

Isolation Protocol
Content Analysis

Time in:_____

Name: _____ Time out: _____

Variable	Time of occurrence	Qualitative	Rating
Pleasant affect			
Unpleasant affect			
Stimulus-bound thought			
Unimpaired secondary process			
Regressed secondary process			
Primary process - Controlled (indicate type: drive, condensation, contradiction, etc., use Rorschach primary process manual)			
Primary process - Uncontrolled			
Imagery - visual			

Variable	Time of occurrence	Qualitative	Rating
Imagery - auditory			
Imagery - other			
Self-stimulation and Exploration			
Immobility			
Quitting			
Sleep (indicate sleep periods in minutes)			

Note the following in margin:

Concern over Time

Body Image Distortion

Depersonalization

Dreams

Interpersonal Communication

Brief note on principal ways S passed time:

APPENDIX B

Isolation Interview

How much moving about have you done?

How much have you slept?

Have you enjoyed any of it?

Have you been bored?

Have you had any bodily pains?

Have you been tense? restless? uneasy or ill at ease? dreamy?

Have you felt suspicious? (about what?)

Did the steady noise bother you? the helmet? the eyecups?

Have you had any 'crazy' or bizarre thoughts? What were they?

(If so) How did you feel about them?

How did you feel about your images?

Have you found any difficulty in thinking, or concentrating on your own thoughts?

What was the most disturbing aspect of the whole experience?

Have you done any dreaming?

Any trouble telling if asleep or awake?

Any daydreaming?

Have you thought about interesting things? Any sexy thoughts?

How in general did you pass the time?

Did you play any games?

What was the most pleasant aspect of the experience?

Did you ever think about terminating the experiment?

Did you wonder about the room? explore it any?

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Research Center for Mental Health, New York University, New York, New York
A COMPARISON OF ISOLATION EFFECTS AND THEIR PERSONALITY CORRELATES IN TWO DIVERGENT SAMPLES, by Leo Goldberger, Ph. D., and Robert R. Holt, Ph. D. August 1961. 54 pp. incl. tables and 21 refs. (Proj. No. 7222; Task No. 71745) (Contract AF 33(616)-6103) Unclassified report

Findings are reported from a pair of replicated studies using male subjects and conditions of perceptual isolation (sensory deprivation) similar to those used in the McGill studies. The first group consisted of fourteen undergraduates; the second group consisted of

(over)

UNCLASSIFIED

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IV. Contr AF 33(616)-6103

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Research Center for Mental Health, New York University, New York, New York
A COMPARISON OF ISOLATION EFFECTS AND THEIR PERSONALITY CORRELATES IN TWO DIVERGENT SAMPLES, by Leo Goldberger, Ph. D., and Robert R. Holt, Ph. D. August 1961. 54 pp. incl. tables and 21 refs. (Proj. No. 7222; Task No. 71745) (Contract AF 33(616)-6103) Unclassified report

Findings are reported from a pair of replicated studies using male subjects and conditions of perceptual isolation (sensory deprivation) similar to those used in the McGill studies. The first group consisted of fourteen undergraduates; the second group consisted of

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sixteen unemployed actors. All subjects were put through an intensive multiform assessment, which included a battery of objectively scorable tests, plus qualitative data from projective techniques, interview, and autobiography. Reactions to the altered sensory environment, which the subjects experienced for eight hours, were judged from the typed protocols of their verbalizations during the period of confinement. In all, fourteen dependent variables were derived from the protocols. These were then intercorrelated, and both the individual variables and their syndromes were related to the variables from the personality assessment. First the general group phenomena, then the patterns of correlations are discussed, with the special emphasis on those that were replicated.

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